



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,597	12/29/2005	Jyrki Kauppinen	028443-071	1736
21839 7590 12/24/2008 BUCHANAN, INGERSOLL & ROONEY PC POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404				
EXAMINER COOK, JONATHAN				
ART UNIT 2886		PAPER NUMBER		
NOTIFICATION DATE 12/24/2008		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary

Application No.

10/529,597

Applicant(s)

KAUPPINEN, JYRKI

Examiner

JONATHON D. COOK

Art Unit

2886

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 16 September 2008.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16, 17 and 19-28 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 16, 17, 19-28 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

Detailed Action

Request for Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/16/2008 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 16, 17, & 19-26 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments with respect to claims 27 & 28 have been fully considered but they are not persuasive. Applicant merely argues the interface for attaching the door is attached on only one side whereas the interface for the art (Meringdal) is attached on two. This is a trivial difference which would produce no unexpected results. Therefore, the examiner maintains his rejection with minor modifications to reflect the applicant's amendments.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
2. Claims 16, 20-22, 19, & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over **de Paula et al** (*High-sensitivity optical microphone for photoacoustics*, Rev. Sci. Instrum, June 1992, pp. 3487-3491, Vol. 63, No. 6, American Institute of Physics) (de Paula) in view of **Jouve et al** (US PAT 5,032,026) (Jouve).

Regarding **Claim 16**, de Paula discloses and shows in **fig. 2** a microphone for photoacoustics, comprising:

a photoacoustic cell (applicant's first chamber) suppliable with a gas to be analyzed;

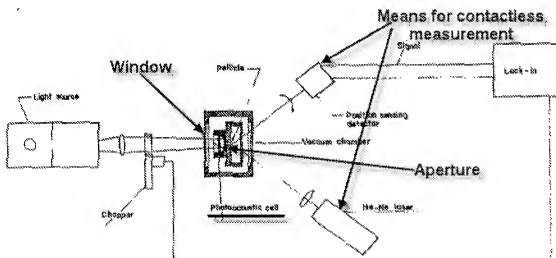
a window for letting modulated and/or pulsed infrared radiation and/or light in the first chamber (see modified figure 2);

a means for detecting pressure variations created in the first chamber by the absorbed infrared radiation and/or light, where the means for detecting pressure variations created in the first chamber by absorbed infrared radiation and/or light, comprise:

an duct (applicant's aperture) provided in the wall of the first chamber, in communication with which is provided a pellicle (applicant's door) adapted to be movable in response to movement of a gas (see modified figure 2);

mounting the pellicle slightly laterally displaced in relation to the duct so that one side of the pellicle touches the border of the duct (applicant's door being at least on one side mounted on a frame structure encircling side faces of the door, as discussed above)(Section II, 2nd paragraph).

a means for contactless measurement of the door movement (see modified figure 2);



(Modified figure 2)

de Paula does not disclose the door being positioned in the aperture and at least one side mounted so that an inner periphery of the aperture surrounds the door;

However, Jouve teaches and shows in **fig. 1** an interferometric sensor for sensing pressure and temperature variations, comprising:

a flat surface (**115**) formed by a metal membrane (applicant's door). From the figure one can see it is positioned in blind hole (**114**) (applicant's aperture) formed by cylindrical ring (**11**) and mounted on at least one side so that an inner periphery of the aperture surrounds the door.

Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of de Paula with the door mounted inside the inner periphery of the aperture because it would provide a better mounting situation that would be less vulnerable to misalignment or damage due to unexpected shocks to the device and the membrane would be more sensitive to vibrations of the gas because of the better fit to the aperture.

Further, the means for detecting pressure variations is not a proper means + function limitation since the claim further goes on to include structure of the means for detecting pressure variations. For purposes of examination the examiner will not consider this means for statement to invoke U.S.C. 112 6th paragraph.

Regarding **Claims 20 & 21**, de Paula discloses and shows in **fig. 2** the means for a contactless measurement comprises an optical measuring system, comprising:

an He-Ne laser (applicant's one or more light source) for illuminating the door as a part thereof; and

a position sensing detector (applicant's one or more detectors) for receiving light reflected from the door and for measuring the door movement as an optical angular and/or translatory measurement.

Regarding **Claim 22**, de Paula discloses the sensor is a bi-cell position sensing silicon photodetector (applicant's double sensor).

Regarding **Claim 19**, de Paula discloses the above.

de Paula fails to explicitly disclose the door and the frame are fabricated from silicon;

However, the choice of one material over another is obvious unless there is a particular reason for it not to be.

Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of de Paula as modified by Jouve with the door and frame made from silicon because it has been held to be within the general skill of a worker in the art to select a known material on the basis of it's suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding **Claim 25**, de Paula discloses the above.

de Paula fails to explicitly disclose the means of a contactless measurement of the door movement are provided in a second chamber which constitutes a measuring space with a volume (V) and which is in communication with the first chamber by way of the first chamber's aperture.

However, while de Paula does not explicitly show the second chamber that contains the laser and detector they at least would obviously be in some sort of chamber and whether it is a room in a lab or a specific housing to contain them and this chamber would have to have a volume. Further, this chamber would have to be in at least optical communication with the pellicle in order to function as disclosed and therefore in communication with the first chamber via the aperture.

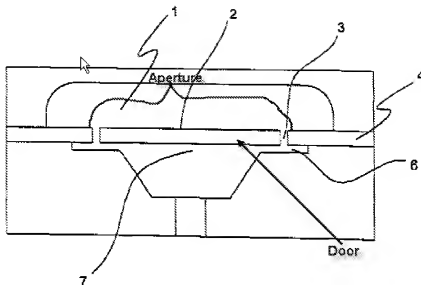
Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of de Paula as modified by Jouve with the second chamber which constitutes a measuring space with a volume (V) and which is in communication with the first chamber by way of the first chamber's aperture because it would have been an obvious matter of design choice to have the second chamber which contains the means of contactless measurement since applicant has not disclosed it solves any particular problem and it appears the invention would perform equally well with or without it.

4. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over **de Paula** in view of **Jouve**, and further in view of **Meringdal** (US PAT 6,474,168) (Meringdal).

Regarding **Claim 17**, de Paula as modified by Jouve discloses the above.

de Paula fails to explicitly disclose the door has a surface area which is at most equal to the surface area of the aperture.

However, Meringdal teaches and shows in **fig. 4** a sensor diaphragm (**2**) which is slightly smaller than the aperture (see Modified figure 4).



(Modified figure 4)

Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of de Paula as modified by Jouve with the door has a surface area which is at most equal to the surface area of the aperture because it will allow for freedom of movement of the door, which will not be brushing against the side of the aperture, and therefore provide better sensitivity to vibratory impulses due to pressure shifts.

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over **de Paula** in view of **Jouve**, and further in view of **Hawke** (US PAT 3,471,238) (Hawke).

Regarding **Claim 23**, de Paula as modified by Jouve teaches the above.

de Paula fails to explicitly disclose the source and detector are designed as a part of an interferometer;

However, Hawke teaches and shows in **fig. 1** an interferometric method for measuring the velocity of a shocked reflective surface. The interferometer includes a laser and a frequency recording apparatus (abstract);

Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of de Paula as modified by Jouve with the source and detector are designed as a part of an interferometer because interferometry is known to be very accurate for measuring distances or slow displacements (**Column 1, lines 47-49**), as taught in Hawke.

With regard to **claim 23**, language that does not limit a claim limitation to a particular structure does not limit the scope of the claim. It has been held that the recitation that an element is "adapted to", "configured to", "designed to", or "operable to" perform a function is not a positive limitation but only requires the ability to so perform and does not constitute a limitation in any patentable sense. *In re Hutchinson*, 69 USPQ 139.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over **de Paula** in view of **Jouve**, and further in view of **Applicant's Admitted Prior Art (AAPA)**.

Regarding **Claim 24**, de Paula as modified by Jouve teaches the above.

de Paula fails to disclose the means for contactless measurement of the door movement comprises a capacitive measuring system as claimed.

However, AAPA teaches The pressure sensor comprises typically a microphone, a thin Mylar or metal film. A photoacoustic detector can be used for measuring or detecting infrared radiation in general, but one specific and important application of a

detector deals with the measurement and detection of gases or gas mixtures regarding for example air quality and pollution. In microphones, the movement of a film (Mylar) is usually measured capacitively. The Mylar film is coated with metal and placed in the proximity of another solid metal diaphragm (**Paragraphs 3 & 4 of the instant application**).

Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of de Paula as modified by Jouve with the means for contactless measurement of the door movement comprises a capacitive measuring system as claimed because it is a typical and well known means for measuring pressure change and would yield predictable results.

7. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over **de Paula** in view of **Jouve**, and further in view of **Sakata** (US PAT 5,629,757) (Sakata).

Regarding **Claim 26**, de Paula as modified by Jouve teaches the above.

de Paula fails to disclose a third chamber, similar to the first chamber as claimed, the measuring of the door of the third chamber similar to that of the measuring of the door in the first chamber, and a means for calculating the amplitude of an actual measuring signal measured from the sensor arranged in the first chamber aperture and a reference signal measured from the sensor arranged in the third chamber aperture, and working out a difference therebetween.

However, Sakata teaches and shows in **fig. 1** a laser strainmeter using reference resonators, which are multiple reflection Fabry-Perot interferometers (**Column 3, lines**

48-50). The difference between the sensor resonator and reference resonator is detected with a counter **(26)**. Then the strain changes are calculated from this difference **(Column 5, lines 17-23)**. Further, the laser strainmeter may be disposed not only in the earth's crust but also in a liquid or a gas as a medium to use it as a pressure gauge **(Column 6, lines 10-13)**.

Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of de Paula as modified by Jouve with the third chamber in order to use it as a reference chamber because it would allow for a more precise measurement of the pressure change by removing noise caused by temperature or atmospheric fluctuations in the second chamber.

8. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Meringdal**.

Regarding **Claim 27**, Meringdal discloses and shows in **fig. 4** a sensor for a photoacoustic detector, comprising:

a frame **(4)** (applicant's panel-like skirt element serving as a door frame); and
a diaphragm **(2)** (applicant's door) separated from the panel like skirt element by means of a restriction **(3)** (applicant's gap);

the diaphragm **(2)** being attached to the frame **(4)** via transition areas **(5)** (applicant's at least on one side mounted on structure of the door frame encircling side faces of the door);

Meringdal does not show the door being on only one side mounted on structure of the door frame;

However, this is modification would be well within the ability of one of ordinary skill in the art and would lead to no unexpected results;

Therefore, it would at least been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Meringdal with the door only being mounted on one side because it would reduce the amount of contact sites with the rigid wall and allow the door to fluctuate more readily with the vibrations which would improve the sensitivity.

Regarding **Claim 28**, Meringdal discloses and shows in **fig. 4** that the sensor is in communication with measurement chamber (7) included in a photoacoustic detector and contains a gas to be analyze, such that the door is moved by pressure variations created in the chamber by absorbed infrared radiation and/or light (**Column 10, lines 20-51**).

Regarding **Claim 29**, Meringdal discloses the above. Since this claim is drawn to an invalid negative limitation only the aforementioned prior art disclosure also satisfies this claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHON D. COOK whose telephone number is (571)270-1323. The examiner can normally be reached on Mon-Fri 9:00am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury can be reached on (571)272-2287. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hwa S. Lee (Andrew)/
Primary Examiner, Art Unit 2886

Jonathon Cook
Patent Examiner
AU:2886
December 8th, 2008